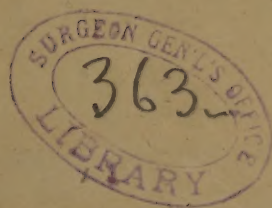


WAITE. (Geo.)

A critical inquiry  
into a few facts connected  
with the TEETH.

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A

# CRITICAL INQUIRY

INTO A

FEW FACTS

CONNECTED WITH

THE TEETH.

BY GEORGE WAITE, Esq., SURGEON DENTIST,

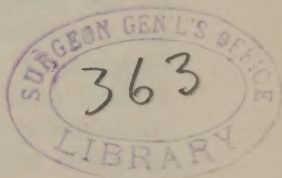
MEMBER LONDON ROYAL COL. OF SURGEONS; LECTURER ON THE PHYSIOLOGY  
OF THE TEETH; AUTHOR OF THE "SURGEON DENTIST'S MANUAL."

“Τὰ πάντα δ’ ἄμα χεῖρ σπένδειν.” Ομη. Ιλιάδ.

BALTIMORE:

PUBLISHED BY THE AMERICAN SOCIETY OF DENTAL SURGEONS.  
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1846.



THE HISTORY OF THE

REIGN OF KING CHARLES THE FIRST  
IN WHICH ARE CONTAINED  
THE MOST IMPORTANT AND INTERESTING  
PARTS OF HIS REIGN  
FROM THE BEGINNING OF HIS REIGN  
UNTIL HIS DEATH

BY JOHN H. M. J. J.

LONDON: PRINTED BY J. H. M. J. J.  
IN THE YEAR 1711



## P R E F A C E .

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THE author has deemed it necessary to institute the present inquiry from various theories which have been given out to the public, these not only differing from the opinions of his late father, but also from those which he still upholds.

Any candid discussion of what will be herein found stated, will always give him satisfaction; and he will maintain his doctrines no longer, if he be once convinced that they are not founded on physiological facts and laws of the animal economy.

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## A C R I T I C A L I N Q U I R Y .

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THE enamel of teeth, in its proper crystallized state, is of extreme hardness, and affords an appropriate covering to parts beneath it; but it is nevertheless subject to morbid changes, these being frequently produced by neglect and by the tenor of nature, which formed it of extreme durability, not being properly appreciated.

If teeth, like substances of the mineral kingdom, had no vitality existing in them, if they were brute productions, not capable of interesting changes, not subservient to the principles of life, and not under the influence of the circulating fluids, I would then say every thing connected with them is uninteresting: but when we see them, as the age of a child advances, adapting themselves to the exigencies of life, and exhibiting a succession of wonderful phenomena, we cannot but confess that every thing relating to them is worthy of notice, nor pay too much attention to those doctrines which tend towards their

preservation, this being a circumstance much connected with the comforts of life, with a healthy temperament and a proper digestion.

If this be not sufficient to recommend them to our notice, we may consider the sympathy which exists between teeth and other parts of the body; the excruciating anguish which attends a decay, where the cavity in the interior of the tooth is exposed, swellings of the face, rheumatic affections, pain mistaken for *tic douloureux*, which is frequently produced, as well as great constitutional irritation, fever, and other bad consequences.

Before we proceed any further, as various misconceived ideas may be entertained as to the manner in which the teeth are deposited and grow, it will be necessary to explain a few osteological points, in order that the reader may fully comprehend the subject.

Ossification commences by a determined action of the arteries to deposit ossific matter; and before the period of birth, instead of bone, we only find cartilages assuming the respective positions of the future bones; but as the age of the child advances, the cartilage begins to appear red, as if blood were circulating in it, it grows opaque, and a small nucleus of ossification begins and increases, according to the length and shape of the bone.

While bone is being deposited, the absorbent vessels are in action, gradually removing the cartilage, and at the same time they give the bone its shape, and form the cancelli and cavities, through which vessels are abundantly distributed. In the middle of long bones a canal is in general perceptible, and through this an artery is seen to pass, sending its branches to the cancelli and towards the extremities of the bone, uniting with other branches from the periosteum, which surrounds the bone, and depositing ossific matter.

The bones of the skull are deposited between two membranes, and the bony part of a tooth on a pulp or vascular bed, while the enamel, the external covering of a tooth, is formed from a juice which is thrown out from the internal lamina of the capsule which invests the pulp.

Nothing can be more interesting than an inquiry into the



growth of teeth at an early period of life; and as the bone of a tooth has peculiarities relating to it, which are not found to exist in common bone, there is additional reason for making a distinct research into every thing which presents itself at the time of its formation.

If we examine the jaws of a *foetus* prematurely born, we find in them several substances which are placed in the situation of future teeth. These substances, like sacs in appearance, are found to consist of a membrane, enclosing a pulp, which is the rudiments of a future tooth; as yet there is no bone on the pulp, but it is similar in shape to the tooth which is about to be formed. In a short time the pulps increase in size and get firm, and in the course of a few weeks a blood-vessel shoots across the surface of that one which is to appear first above the gums. Its vascularity increases, and a thin shell of bone is found to have been deposited on its extreme point. In the incisor teeth, ossification commences at three points; and in the other teeth, at points corresponding to the number of future points which are to be found on the tooth. Ossification still advances, and that part of the pulp is most vascular which is covered with bone; the small osseous portions increase in size, gradually unite and form one thin layer of bone, which spreads itself over the surface of the pulp, and downwards towards the neck of the tooth. The bone increases in thickness, and a further examination leads us to conclude that it is formed of successive layers of matter thrown out from the pulp.

When the bony part of the tooth advances towards its perfect form, from the internal lamina of the capsule, a juice exudes, which is afterwards found to form the enamel. The fluid is at first thin, but quickly thickens, crystallizes, and becomes the enamel. As to the manner in which it crystallizes, and becomes united to the bony part of the tooth, various arguments might be deduced, but the minute arteries of the capsule are the agents instrumental in its deposition, and it may itself be considered as a gland from which the fluid is secreted.

It might perhaps be well to consider the different appearances displayed in fractured bones, the manner in which an exudation comes from the extremities of their arteries, gets hardened, and

unites the two portions inseparably together; but in the enamel of a tooth, an additional quantity of hardening matter is contained, which gives it its peculiarity. The manner in which the enamel is deposited may now be perceived; all solids of the human body are formed by the fluids, hence its component parts were originally in the blood, but have been separated from it.

No instance is on record of the enamel of a tooth being twice generated; this it was almost useless to mention, for no parts are left to concur in the action, the roots of the teeth have all been formed, the tooth itself has taken the situation in the mouth that nature intended it should, and in so doing has forced its way through the capsule, which membrane, having performed the function that nature allotted to it, shrinks and becomes connected to the adjacent gum.

The enamel of teeth is the hardest part of the animal body, neither are there many material substances to which it will yield. It may be compared to polished steel, being scarcely acted on by the saw or file; but the laminated structure which it is well known to have, renders it more easily affected by chemical means.

The strength of the enamel depends very much on the state of the constitution at the time of its formation, and it was then entirely under the influence of the circulating fluids. In the mouths of weak and delicate children, although the teeth are sometimes large and apparently good, yet the arteries had not the power of forming a sufficient deposition, and the covering to the bony part is thin and soon decays. Very often in the mouths of children who have suffered considerably during the time of teething, the enamel is deposited in great scarcity, it being here and there altogether wanting, and putting on an appearance commonly known by the name of the honeycomb disease. This is by the same cause, the constitution being in a weakened state, and the arteries having to perform functions indispensable to existence, deposit the enamel but scantily. This would appear to be during only a certain space of time, so long as the debilitated state continued, for if we examine the teeth individually, we see on each that was being formed about the same time, the peculiar appearance which I have mentioned; but the part of



the enamel corresponding to the neck of the tooth which was afterwards being formed, is in general good ; hence, when the tooth has arrived at its proper growth, a portion of the edge may be removed and made smooth, and the beauty of the mouth considerably enhanced.

The color of the enamel likewise varies very much, sometimes white specks are discernible on it, and at other times it is of a deep fleshy color, as if much animal matter was contained in it.

These peculiarities depend upon the greater or less quantity of lime that was separated from the blood at the time when the enamel was being deposited; in a similar manner as the honey-comb disease depends upon debility of the constitution.

Having so far proceeded, we may now inquire into the different causes of decays of teeth ; these may be classed as follows :—first, a weak enamel ; secondly, a peculiar formation of the tooth itself, and a too close apposition of one to the other ; fourthly, a constitutional predisposition and neglect.

It is worthy of notice, that there is an appearance about the enamel of teeth, by which a correct eye may judge of their texture, as well as their disposition or tendency to decay ; and a physiologist, well acquainted with the nature of disease, may, by a person's look, nearly judge as to the state of the teeth, by the same rule, as a child's face affords a good criterion whether or not scrofula exists in the constitution ; this requiring, however, a knowledge of disease and long attention.

When teeth are in too close opposition, if their sides are flat and broad, and the constitution in an unhealthy state, a decay frequently commences between the front upper teeth, arising partly from the continued pressure, but principally from a peculiarity of the saliva and mucus of the mouth, which acts on the enamel, and causes it to lose its regular crystallized texture ; here, from the peculiar formation of the teeth, no tooth powder or brush can touch the diseased part, and thus it becomes necessary to file down to it, and then, by friction and the use of a tooth powder or spirits, it may be brought to a hardened and polished state.

Having arrived at this part of the inquiry, it will be necessary

to point out a few facts which will show the injudicious method, lately much adopted, of not brushing the teeth with an appropriate tooth powder; but previously to this, I must explain the manner in which decays commence, which could not have been understood by those who have spoken against their use.

A decay almost always commences in some obscure part of the mouth, where part of the tooth is not exposed to friction, by different substances there lodging and acting on the enamel.

It is well known that by chemical means we can dissolve the whole of a tooth; if, therefore, there is contained in the saliva, in the mucus which we find in the morning in the mouth, or in substances which we put into the mouth, any such ingredient, even in a small quantity, it must in some measure soften the texture of the enamel. A decay in its primary or incipient state, is no more than a roughness; but this affords a convenient lodgment to substances very deleterious to the enamel. In a short time the part of the enamel most exposed to the action we have considered, is much softened and discolored, the decay points inwards, increases and soon attacks the bony part of the tooth, which, being of a softer texture than the former substance, is more easily eaten away. The caries still further continuing its progress, exposes the nerve in the interior of the tooth, and causes pain and inflammation. Such is the manner in which I have, with an unbiassed judgment, observed the progress of a decay. I took as much care as possible in making my experiments, not to try them to prove any favorite hypothesis, but to be able conscientiously to assert facts, as deduced from microscopic observations, and my theories I hope always to be able to support.

The necessity of putting a polish and preventing the lodgment of offensive matter on the part where the decay is about to begin, must evidently be seen; but a brush itself is insufficient to do this, and a tooth powder must be resorted to. It is here necessary to make a selection—the powder must contain no acidity, it must be hard enough to remove any adventitious substance from the surface of the tooth, but much softer than the enamel.

A very wide difference exists in the mouths of different per-

sons ; some mouths collect very little tartar, insomuch so, that a brush alone, or merely wiping the teeth with a towel, is sufficient to keep them clean ; whilst in others it collects in such abundance, that even by tooth powders it is impossible to brush it off ; and the accumulation goes on increasing, sometimes in an incredible manner, and eats its way down between the edge of the gum, which is loose round the tooth and the root, causing considerable irritation. The use of the tooth powder is here however very serviceable, and it must be remembered that the accumulation is principally behind the front teeth of the lower jaw, which, from their situation and shape are with difficulty got at ; but were they differently shaped, and as great care taken of them at their back as well as their front part, they would present as cleanly an appearance as in any other part of the mouth.

To ascertain the utility of a tooth powder, I have repeatedly made experiments : I have found decays commencing on the outside of a tooth, and have made the part smooth, and advised it to be continually brushed with a tooth powder, and the caries has altogether ceased. It is a curious but well known fact, that if a tooth on one side of the mouth commences to decay, the corresponding one on the opposite side is in general soon attacked. This has hitherto appeared inexplicable, but may be ascribed to the similarity of conformation that one tooth has to its corresponding one in the opposite jaw, and to the same cause which affects the one being likely to do so to the other. When operating upon a tooth, I invariably expect something to be wrong in its corresponding one, and have frequently perceived, by means of the microscope, a decay in its commencement, and by the practice I have mentioned, have very often seen its progress arrested.

Decays of teeth very frequently commence on the tables or upper surfaces of the grinding teeth, owing to depressions formed in them ; at the bottom of these depressions are small sulci, and in these, injurious substances easily lodge. It was owing to this that my father so strongly recommended the use of very hard brushes to this part of the tooth, in order to put a proper polish on it ; and the enamel being of a very firm texture, brushes of the hardest bristle will not rub it away.



Many misconceived ideas as to hard tooth brushes, have been deduced, owing to the attrition which goes on by one set closing against the other; by this we frequently see the teeth much worn down, and I have often observed the back of the upper incisors worn in a similar manner to those of the glires or rodentia, whose teeth are adapted for gnawing—hence the mouth of man ought to be compared to that of three different genera of quadrupeds. I deny that the brush effects this change on the teeth, and as a proof of it, I refer my readers to any teeth in their own mouth, on which much pressure falls. It is well known to those who study comparative anatomy, that the enamel pervades perpendicularly the teeth of graminivorous quadrupeds, and that attrition still goes on. It is likewise known that the front teeth of the rodentia are worn down and left with a sharp edge, by the under ones closing behind them, and I need scarcely say that this is not caused by the use of tooth brushes.

We may draw an analogy between the offices of the grinding teeth of graminivorous mammalia and those of man; and as I see the surfaces of the teeth worn as much in the mouth of those who do not use hard brushes as in the mouths of those who do, for the sake of cleanliness, and the preservation of the teeth, I adhere to my late father's system, and universally recommend them.

We may now inquire whether decays of teeth commence from external or internal causes, or whether on the external or internal part of the tooth.

Decays of teeth commence both from internal and external causes; but here a confusion has arisen, for the decay, although arising sometimes from constitutional causes, commences on the external part of the tooth. The external causes of decay are substances which soften the enamel taken into the mouth, as food or medicine. Although decays of teeth seldom commence internally, yet instances of it come under our notice, here a blue color of the bony part is perceptible under the enamel, and the decay may be easily found by cutting down to it.

I have hereinbefore mentioned that there is a peculiarity about the enamel of all teeth subject to decay; but the teeth

which I have most frequently found attacked by it, are those on which the enamel is deficient. Their surfaces present a rugged appearance, several points are seen sticking up on the surface of the tooth, and in the depressions where a layer of enamel is most wanting to protect the parts beneath, it is found not to have been deposited, the result must unfortunately be anticipated. When the tooth has its original and appropriate covering, it is frequently incapable of resisting the action of substances which lodge on its upper surface; then, as this is the case, how will the bone, which is soft and porous, be able to resist that which the enamel could not? a wide difference exists between there being no enamel corresponding to these depressions, and when we deprive a tooth of part of it by the file, in order to prevent a decay from increasing. The following cases, relating to teeth subject to decay, it may be worth while noticing:—

In the mouth of a young lady, aged fourteen, of a delicate habit, the enamel was deficient in all the teeth, (the *dentes sapientiæ* were not yet formed;) before I attended her, she had lost the second bicuspid, the two grinding teeth of the upper jaw on the left side, and the first grinder of the lower jaw; every remaining tooth in her head, except those in front, were attacked by decay, and some of them in a serious manner.

Another case, almost similar, presented itself, where all of the teeth, except those in front, were attacked by decay; but in this mouth there was a slight peculiarity, the two front incisors were large and perfect, but the lateral ones were wanting; and it appeared as if nature had been making an effort to add a little beauty to the mouth, and that the juice destined to form the one had been wasted on the other.

A third case was in the mouth of a young nobleman, of an illustrious family: on all of the teeth the enamel was deficient, great care had been taken of his mouth, the bicuspidæ being near the front of the mouth, were easily cleaned and remained sound, the first grinders had been filled with gold and preserved, and as soon as the second appeared they required a similar treatment. I might relate numerous cases, but an operator will not have much difficulty in practically observing them. This will benefit him much more than any narration that can be given.

## PART II.

I purpose now mentioning a disease or process which is one of the most curious to which the human frame is incident, and its intricacies and peculiarities have rendered it hitherto inexplicable.

I do not profess herein to lay down theories which I say must be correct, or to unravel mysteries which other authors have not done; but I wish to prove, contrary to the statements of the present dentists, that the process of denudation, as it has been called, and a receding of the gums from the necks of the teeth, depends either on a peculiar state of the system, or some constitutional cause.

At a certain time of life, or after the administration of certain medicines, which act principally upon the absorbent system, the gums frequently recede, owing to the thin prominent edges of the sockets being exposed to its action; and here sometimes a curious appearance presents itself, this, however, varying greatly. The most frequent appearance of the disease is a groove, which is formed at the neck of the tooth, extending round it. This is sometimes of a semi-elliptical shape, and sometimes triangular, having the exact appearance as if a file had passed round it; and I have seen it in the triangular state, extending in such a direct line along all the teeth, from the canine backwards, that it would be almost impossible for any one, not versed in the laws of nature, to imagine but that it was the work of art.

Owing to an improper conception which most dentists have of the power of absorption peculiar to vessels destined for this office, as well as an incorrect idea of the deposition in early life from the arteries, absurd and unscientific statements have been given out, endeavoring to prove that this disease and an absorption of the sockets, a process unavoidable as we advance in years and approach old age, perfectly natural to the animal economy, and incident to the human race in every climate, should be caused by the accident of a simple tooth brush; but the fallacy of these representations may easily be conceived by those who



have paid attention to the immortal works of the late Mr. John Hunter. Although the cause of the denuding process appeared to him intricate, yet, from circumstances, he states it to be an original disease of the tooth. If he had attributed it to the action of the absorbents, he must then have recalled theories, and made many of his experiments appear by no means complicated. It is well known that he denied the existence of vascular action in the bony part of a tooth; he allowed that it possessed life, but that was a vitality peculiar to itself and independent of circulation; he made various experiments—he transplanted teeth into the combs of cocks, and they fastened. At the result of these experiments he was well pleased, for his conception of the bony part made this appear improbable to him. After his opinions were given out to the world, he repeated his experiments, and was always highly gratified at the manner in which the teeth fastened.

But if, with an unbiassed judgment, we examine the successive changes of a tooth, from an early period of *utero gestation* till its fall, we see circumstances which induce us to conclude that it possesses a degree of life, and that a circulating fluid exists in it necessary for its nutrition. It is well known that a vascular action is more perceptible in young bones than old ones; but in the bony part of a tooth there is a difference, for in adolescence this substance is of a white color; but in old age it becomes red, as if blood was contained in it.

When the bony part of a tooth is first deposited, the periosteum is not attached to it; but whether or not it throws out a juice which unites with and forms part of the bone, might perhaps be doubted; suffice it to say, that it becomes united to the bone, as may clearly be seen by maceration. Little change takes place, generally speaking, till after middle age, when the waste of the body, by the action of the absorbents, begins to exceed the deposition from the arteries.

The ends of the sockets are thin and protrude, they are exposed to the action of the absorbents, and are more easily laid hold of than other parts; the teeth all bear the same or additional pressure to what they originally did, and a part of the socket being removed, they are much less firm than they were.

The result is as follows:—they are loose and move in the sockets, the periosteum becomes irritated, and by the consequent determination of blood to it and the surrounding parts, they appear much more vascular than they originally did. Thus may the red appearance of the root at this time of life be accounted for, but it is evident that some circulation exists in it.

The discoloration which occurs when the vessels in the interior of a tooth are destroyed, affords us likewise an ample proof of its vitality depending on a circulating fluid, for as long as it is nourished it retains its white color; but when the vessels in the interior are destroyed, it becomes dark and discolored, it adheres, however, to the socket, for vessels pass from the periosteum, serving to retain it *in situ*.

Many other circumstances might be brought forward to prove that the vitality of a tooth depends on vascular action, but these it is trusted will be sufficient. We must now consider the denuding process; but I think it previously necessary to say something respecting the absorbent system.

Among the phenomena of life, absorption is a process necessary to be understood by the medical practitioner, as the renovation, growth, and decay of parts, depend greatly on its action.

The absorbents are small delicate pellucid tubes, which exist in all parts of the human body, in the external and internal surface of our organs, and their office is to carry into the circulation substances adapted to the exigencies of life, as well as that coming away in the continued destruction of parts.

In the intestines the lacteals take up the nutritious part of the food, and convey it into the blood; and in the infant, while the process of ossification is going on, and bone is being deposited in the bed of cartilage, that, *pro tempore*, occupied its place, the absorbent vessels are in strong action, take away the cartilage into the blood, and make room for the deposition of bone. This is the nature of these vessels; but here is an omnipotent and admirable contrivance, illustrative of intent and mechanism, plainly seen in them.

Absorption, although less active on the external part of the body, is continually going on, notwithstanding the epidermis, which is perhaps insensible and inorganic, and naturally, by its

thickness, rendering the process difficult. The origin of these vessels is thus explained in Richerand's Physiology:—

“The radicles from whence they arise have orifices so very minute, that they are imperceptible to the naked eye; a tolerably accurate notion may be formed of them, by comparing them to the *puncta lachrymalia*, which are larger and more easily discovered. Each orifice endowed with sensibility and with a peculiar power of contraction, dilates and contracts, absorbs or rejects, according as it is affected by the substances which are applied to it. The variations of the absorbing power, according to the age, the sex, the constitution, and different periods of the day, show that it cannot be compared, as several physiologists have done, to that principle which makes fluids ascend contrary to the laws of gravitation in capillary tubes. If absorption were a process merely mechanical, it would in no case be accelerated or retarded, and would proceed with a regularity never observed in the vital functions. The mouth of every lymphatic, when about to absorb, erects itself, draws towards itself, and raises the surrounding membranous parts, and thus forms a small tubercle, similar to the *puncta lachrymalia*.”

In the above allusions, I have but slightly mentioned the power of the absorbents, but it is well known that there is a continued renovation and decay going on in all parts of the system. The thymous gland, so perceptible in children, becomes absorbed as they advance in age, the absorption carrying on decomposition with a force not to be resisted, and frequently producing erosions of living solids, of which ulceration is the consequence. When a sharp spicula of bone protrudes from any point and causes irritation, the absorbents act on it, remove the irritating edges, and render it smooth, so as the parts heal over it. We now see that not only are soft parts taken up by these vessels, but that bone itself yields to their action. We have, in the extraction of teeth, an appropriate fact connected with the absorbent system; the edges of the sockets have a disposition to approximate, and at the same time an absorption is going on, removing the part no longer useful; so when we examine a cleansed lower jaw, we find only a ridge of bone in



the space formerly occupied by a tooth. That the process of denudation is by some remote cause connected with the absorption which takes place in the sockets, seems highly probable, on account of the waste that exists in the parts around. I have never yet seen the disease without an alteration in the parts around; I have seen it at different ages, but most frequently after middle age, the period at which the body begins to waste. When it occurs in early life, the patient's constitution has in general been debilitated, and as debility is known to be favorable to absorption, we may easily account for the gums receding at that period; for it must be noticed, that they do not recede at this period but in the mouths of those of delicate health, or who have taken much medicine.

Independently of what has been already mentioned, the denuding process puts on other appearances; it sometimes deprives the whole anterior surface of the teeth of their enamel, and consequently leaves them yellow and unseemly; this is the disease in its worst state: it generally commences from a corner of the tooth, and takes a slanting direction upwards. This the late Mr. John Hunter has noticed, and its nature may be considered very intricate.

I have sometimes known the disease to commence, form an oval cavity in the tooth, and then stop altogether; it also frequently commences on the sides of the necks of the teeth, and appears to cut through them with as great precision as if a saw had been used for the purpose. This I have seen in such a situation as the brush could not touch.

I have in my possession several very curious specimens of the disease; the one most worthy of attention is, where it has commenced at the inner side of a tooth, a groove has been formed, which takes a spiral direction, making rather more than a turn round the tooth, and at the bottom of this groove there is another one, which is much smaller, appearing as if a worm had eaten its way round it. The vascularity of the root is greatly increased, for it appears red as if blood were contained in it. I once showed this specimen to an eminent anatomist, and at first appearance he felt convinced that it was caused either by the periosteum or the gum.

I believe that I was the first person who observed the periosteum at the neck of the tooth, being with the gum more firmly there connected to the root than at any other part; and it appeared probable to me, that as the gum receded, if the absorbents were in very strong action, they could easily remove a part of the bony part of a tooth; I have since seen cases which made my suppositions appear more probable, and these have been strengthened by assertions from persons affected.

A dyspeptic patient last year applied to me to clean his mouth. The gums were rather in an unhealthy state, all the back teeth were much decayed, and the mouth exhibited a disagreeable appearance. I saw the same person a few days ago, he had been very unwell in Edinburgh, shortly after his first visit to me, and it was thought necessary to administer mercury to him; his gums were much affected by it, and they now had a scorbutic appearance; they had also receded from some of his front teeth, and where the recession was worst, the denuding process had commenced. It had eaten away part of the enamel and bone corresponding to the necks of one of the upper and lower incisors, and on the others there was a rough ragged appearance, as if it had been broken down and decomposed. I named the peculiar appearance to my patient, and the opinion of some dentists as to the brush effecting the change. He told me that since the exhibition of mercury his gums had been in such a very tender state, that it had been almost impossible for him to use the tooth brush; but he said he thought it was caused by the medicine which he had taken. I have been told the same by other patients.

I was applied to by a person of rank to examine his teeth and gums, which presented the following appearance:—The gums had receded very much from the necks of the teeth, especially on the left side of the mouth, so much so, that the division of the roots could plainly be seen. The denuding process had commenced on all the teeth, and had taken the slanting direction from their corners; much of the enamel had been removed, and the gums had so far receded from the necks of the teeth internally, as to leave only the tips of the roots covered. He had been told that the loss of enamel was occa-

sioned by repeated friction, and it was by that, I believe, discontinued. The gums became spongy, as no method was adopted to allay the irritability ensuing from one set striking against the other, when the roots had no sockets to support them. The consequence was suppuration of the periosteum, occasioned by the continued jar, and the blood no longer circulated freely through the gums, but they became spongy, and the teeth loosened.

Having explained the leading points connected with the disease, we may consider whether it is caused by mechanical or constitutional effects. It commences often at a certain time, and then, when the health improves, stops. We find it in situations on the teeth which the brush has difficulty in touching, as well as on the teeth of persons who seldom brush them. It has a peculiar shape, which it would not have if caused by the brush; and I have never seen it without observing a change in the parts all around: I mean an absorption of the sockets, which has caused the gums to recede.

That the disease is curious, every one must allow; for the enamel of teeth, although originally in the mass of blood circulating through the system, has become hard and crystallized. The power of the absorbents is wonderful; so is that of the gastric juice in the stomach. When a sharp spicula of bone protrudes from any one point, it at first causes considerable inflammation, but in process of time the absorbent vessels remove its sharp edge; and when the waste of the body exceeds the deposition from the arteries, the absorbent vessels easily lay hold of the thin prominent edges of the sockets, and convey them into the blood. Thus it will be perceived that a change can be produced on bone, and we may account for the disease commencing at the neck of the tooth. But doubt may arise whether these vessels can so far carry on decomposition as to take away the enamel; this I do not altogether pretend to decide; but I certainly must deny that the change is produced by the action of a tooth brush.

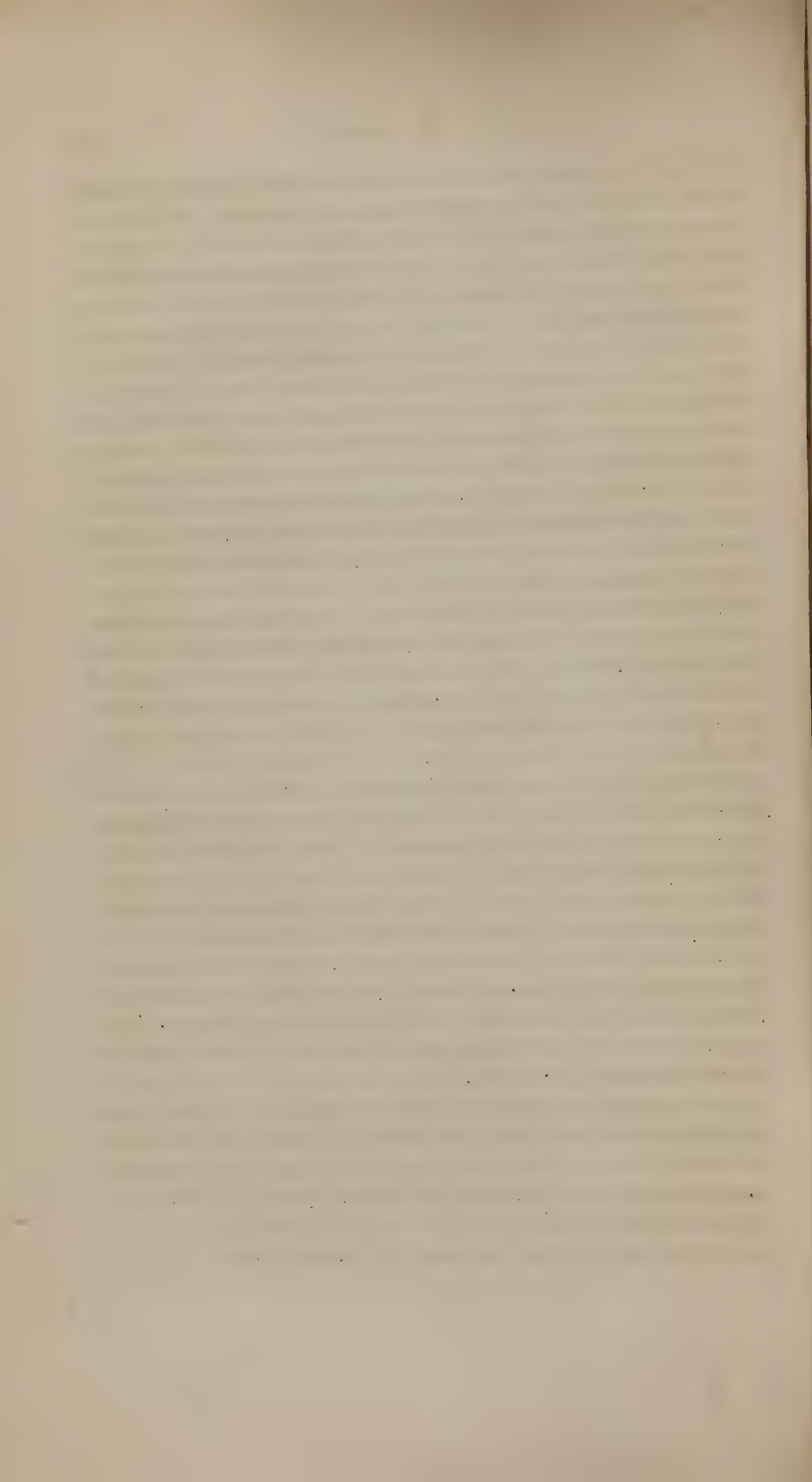
Another misrepresentation has been given out, the absurdity of which I must mention, namely, that a receding of the gums is likewise occasioned by the use of tooth brushes. In the



mouths of people of every nation, and of every class of society we see it; many of these never use tooth brushes; the absorption commences when it is to be expected, after middle age, or after the exhibition of medicines which rouse the absorbents into action. If we examine the lower jaws of indentulous individuals, we see the sockets of the teeth completely removed, the depth of the bone is considerably shortened, the chin projects, and a deposition of osseous matter has been going on in the bottom of the sockets, so that they are quite unperceived. If the gums were worn down by the action of the brush, the tips of the sockets would be left protruding.

For the last ten years of my life, I have perhaps brushed my teeth and gums harder than any person in England. I may say that I have endeavored to rub them away, but in vain; I have sometimes gone so far as to make them sore, but the result I find is this, that the soreness heals in an almost incredible manner, that the next morning there is a somewhat cartilaginous deposit on them, exuded from the openings of vessels on their surface, sometimes perceptible to the naked eye, and that when healed there is an increase rather than a decrease.

The structure of the gums is certainly parenchymatous, and from the vessels principally composing it, other minor ones pass, which open on their surface by minute orifices. This renders a free circulation through them particularly necessary, for the small vessels become easily choked up, and the blood remains coagulated in them. Nothing is more adapted to giving them strength and a healthy appearance than repeated friction. I see no justifiable reason for speaking against it, but my sincere wish is that every doctrine which can tend to the benefit of mankind may be promulgated. If those who assert that the gums are rubbed away by the brush, instead of receding as the socket absorbs, can give me any physiological reason why it should be so, I will then be tenacious about recommending friction to them; at the same time I trust that I have scientific principles and common sense to hold me out; and am emboldened by an additional reason, viz. that these principles were at an early age held out to me by my late father.



## SUPPLEMENT.

### EXCISION.

AT the present period nothing is aimed at but novelty, nor do many productions succeed which follow the regular line of going on; and while men of science pursue honorable and just means to bring themselves into notice, their reputation is frequently surpassed by contemporaries brought forward by some lucky coincidence.

The operation which we are about to notice, consists simply in laying hold of a tooth with a large pair of cutting forceps, as high up as possible towards the extremity of the roots, and pressing the handles firmly together; it must however be noticed, that different instruments are required, each adapted to the shape of the neck of the tooth that is painful.

If we take a tooth and split it, or saw it across corresponding to its neck, we find in the middle of it a cavity, which contains a portion of the pulp still remaining. It was the pulp that originally deposited the bony part of the teeth, and it is found greater or less, according to the age of the patient. In young people it is large, and in old ones much less perceptible.

If we look at the bottom of the root of a tooth, we find a small hole through which vessels pass; but the root of a tooth is formed later than the crown; and if we examine a tooth extracted from the mouth of a young person, we find a large passage through the root to the internal cavity.

It will be seen that the operation of excision must be most successful when performed in the mouth of an elderly person, the internal cavity is more filled up, and there is not so much danger of cutting directly through the extremely sensible part contained in it.

The operation points out no new facts to London dentists.



All hospital pupils are well aware that when by an unskilful extraction they leave the roots of a tooth in a patient's jaw, the part of the tooth is no longer so liable to pain as it was, and they endeavor to console the poor sufferer with this fact. But if the vitality of the root be destroyed by the operation, it remains in the jaw as an obtrusive and dead part, and finally produces an abscess in the gums.

The principal advantage gained by breaking or cutting off the crown of teeth is, that the stumps remain in the socket and prevent its sides from approximating; and I have heard an eminent continental dentist with whom I resided, propose the operation in question, when a female has wished to preserve her teeth, that her good looks might not be impaired.

We have pointed out an inconvenience from stumps deprived of life remaining in the jaw. I recollect continually hearing my foreign friend say, "*Ces chicôts ne font jamais du bien dans la bouche.*" I am perhaps a little biassed to his opinion, but have, under peculiar circumstances, both recommended and performed the operation now called excision.

We will now suppose the remaining part of the tooth to have much life left in it; the nerve which passed up originally to the internal cavity, and which was furnished with a covering, is exposed, and pain and a susceptibility to inflammation is the consequence; this however is much less when the tooth has been cut off high up. The operation, however, like filing a tooth, leaves behind it some sensibility, but this becomes diminished by a frequency of impressions.

With respect to the expansion of the nerve of a tooth, a mistake has certainly arisen; a nervous ganglion or plexus would have been better applicable to the seat of pain, more especially in the grinding teeth, where two or more filaments pass up through the roots, and become united in the pulp. The cavity is for containing the remains of the pulp, and this becomes diminished in size as we approach our dissolution.

The subject would be unexplained, did I not make some remarks respecting tooth-drawing. For this purpose, a large pair of forceps, instead of a claw, has been lately brought into use by an eminent dentist, who after my father's death came to re-

side as my opposite neighbor. But when surgeons attempted to use these instruments, generally, instead of extracting the tooth, they severed it into two parts, consequently performed the operation for excision, but without much nicety; they were not cautious enough about getting hold of the tooth high up towards the roots, and cut directly through the gum and internal vascular part, putting their patient to great torture. The circumstances which led them into error were as follow: they went to instrument makers, and indiscriminately purchased forceps more adapted for excision than any other purpose. I should therefore feel gratified if, by these hints, I have thrown any light on their use; their edges ought neither to be sharp nor turned too much inwards. This I had at an early period of life explained to me, and during my stay on the continent, and at the London hospitals, have always preferred using them. I must lastly give my readers one caution, that is, to draw a definition between cutting and extracting forceps.

